6-6: Fitting a Quadratic to Data

Warm-up: Solve the system.

$$\begin{cases} -11 = 4a + 2b + c \\ -14 = 9a + 3b + c \\ -15 = 16a + 4b + c \end{cases}$$

Question: How many points do we need to be able to determine a specific line?

Follow up: How many points will we need to be able to determine a specific parabola?

Quadratic Model:

***Remember, *y* and *x* are the variables in the equation. We need to determine what a, b, and c are.

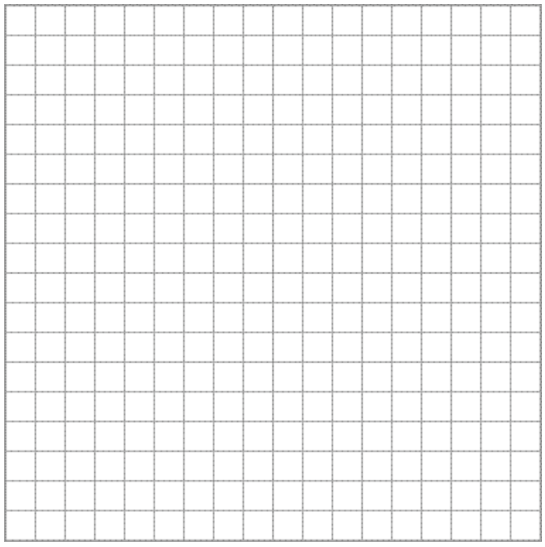
Example 1: A batter hit a baseball when it was 2 feet off the ground directly above home plate. It was about 12 feet off the ground when it passed over the pitcher's head (60 feet from home plate). It was caught 4 feet off the ground by an outfielder 300 feet away from home plate. Find a quadratic equation relating the height *h* of the ball to its distance *d* from home plate.

Example 2: The table below gives the prices of a TV made by Mitarnowski Vision.

Size s (in.)	5	9	13	19	25	31	35
Price p ($)	240	158	125	275	610	1145	1690

a. Draw a scatterplot of the data.

b. Fit a quadratic model to the data.



c. Use your model to predict the cost of a 39-inch television.

Since we are finding a model, we may not all get the same equation.

Homework:

"The world is so fast that there are days when the person who says it can't be done is interrupted by the person who is doing it." - Anonymous